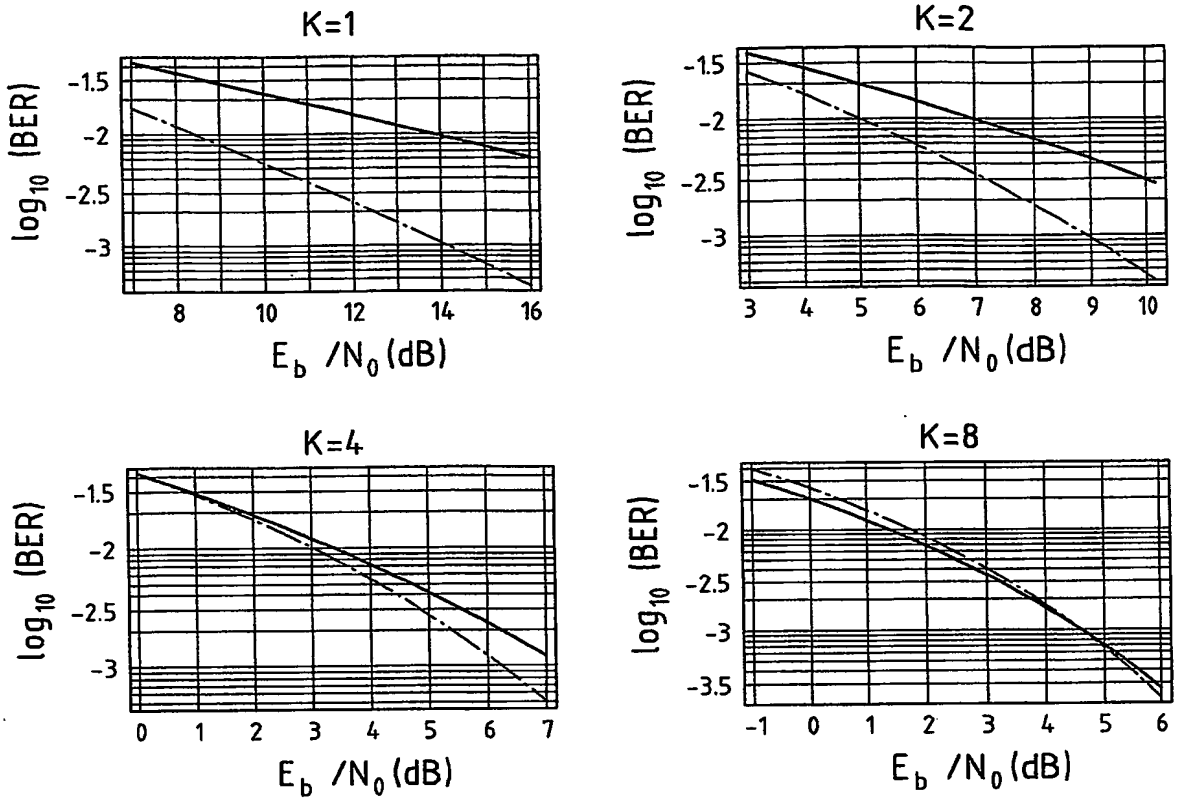


Fig.1 Prior Art

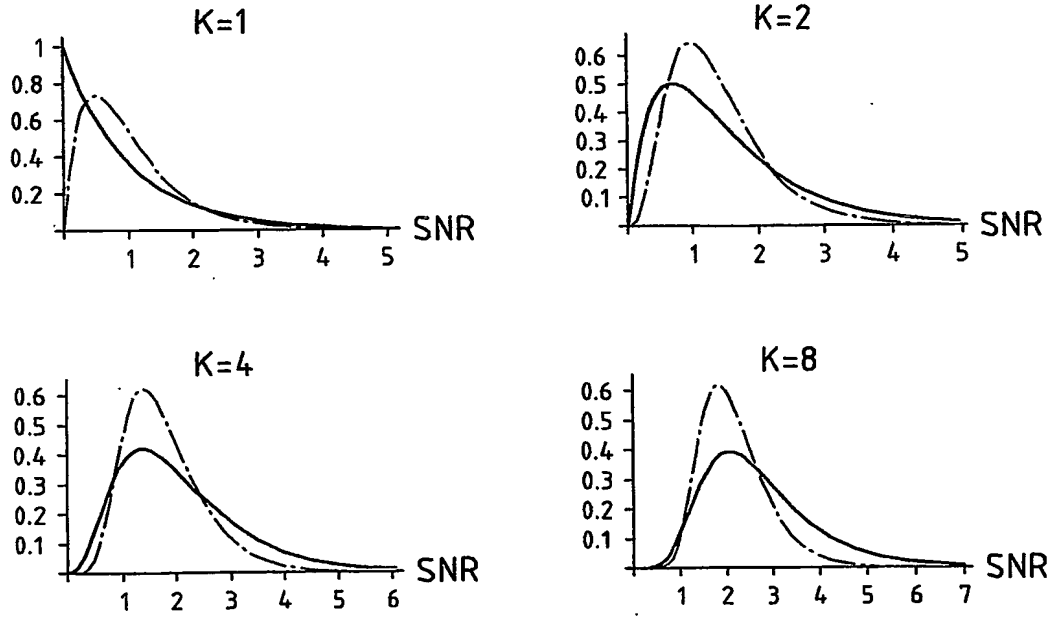
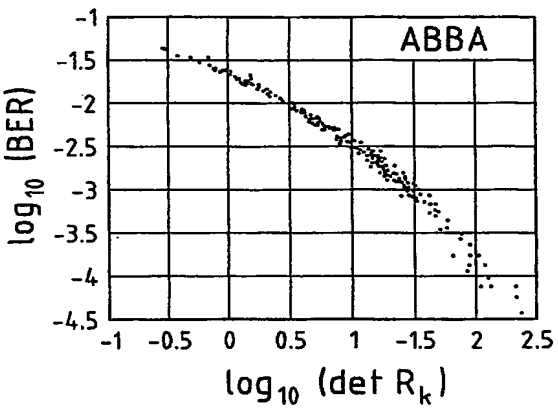
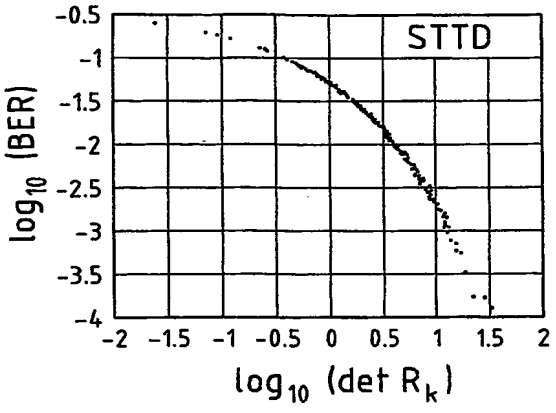


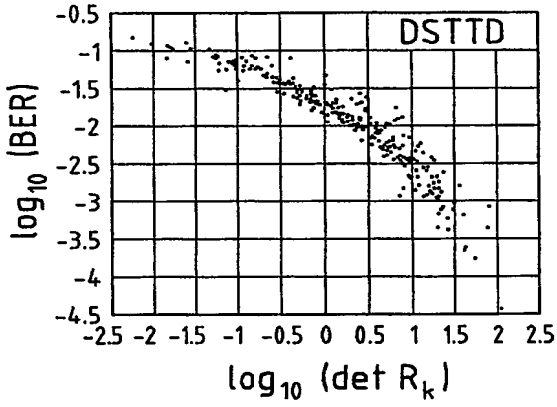
Fig.2 Prior Art

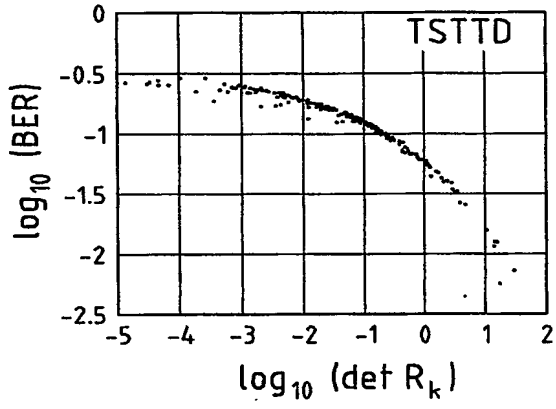
modulation	calculation method	R_k multipls	R_k adds	det R_k multipls	det R_k adds
ABBA	direct	128 Cx	112 C+	40 Cx	30 C+
	proposed	12 Cx	10 C+	3 Rx	1 R+
DABBA	direct	512 Cx	448 C+	79176 Cx	18880 C+
	proposed	20 Cx	12 R+ and 3 C+	7 Rx	3 R+
TSTTD	direct	64 Cx	48 C+	40 Cx	30 C+
	proposed	6 Cx	2 R+ and 1 C+	total R_k 3 Cx	and det R_k 1 C+

Fig.3


ABBA
log10 (BER)
log10 (det Rk)


STTD
log10 (BER)
log10 (det Rk)


DSTTD
log10 (BER)
log10 (det Rk)


TSTTD
log10 (BER)
log10 (det Rk)

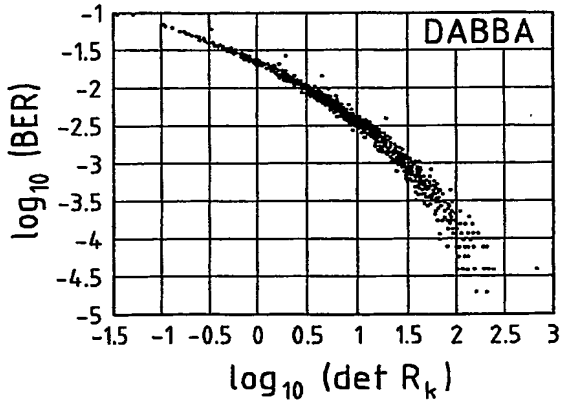

DABBA
log10 (BER)
log10 (det Rk)

Fig.4

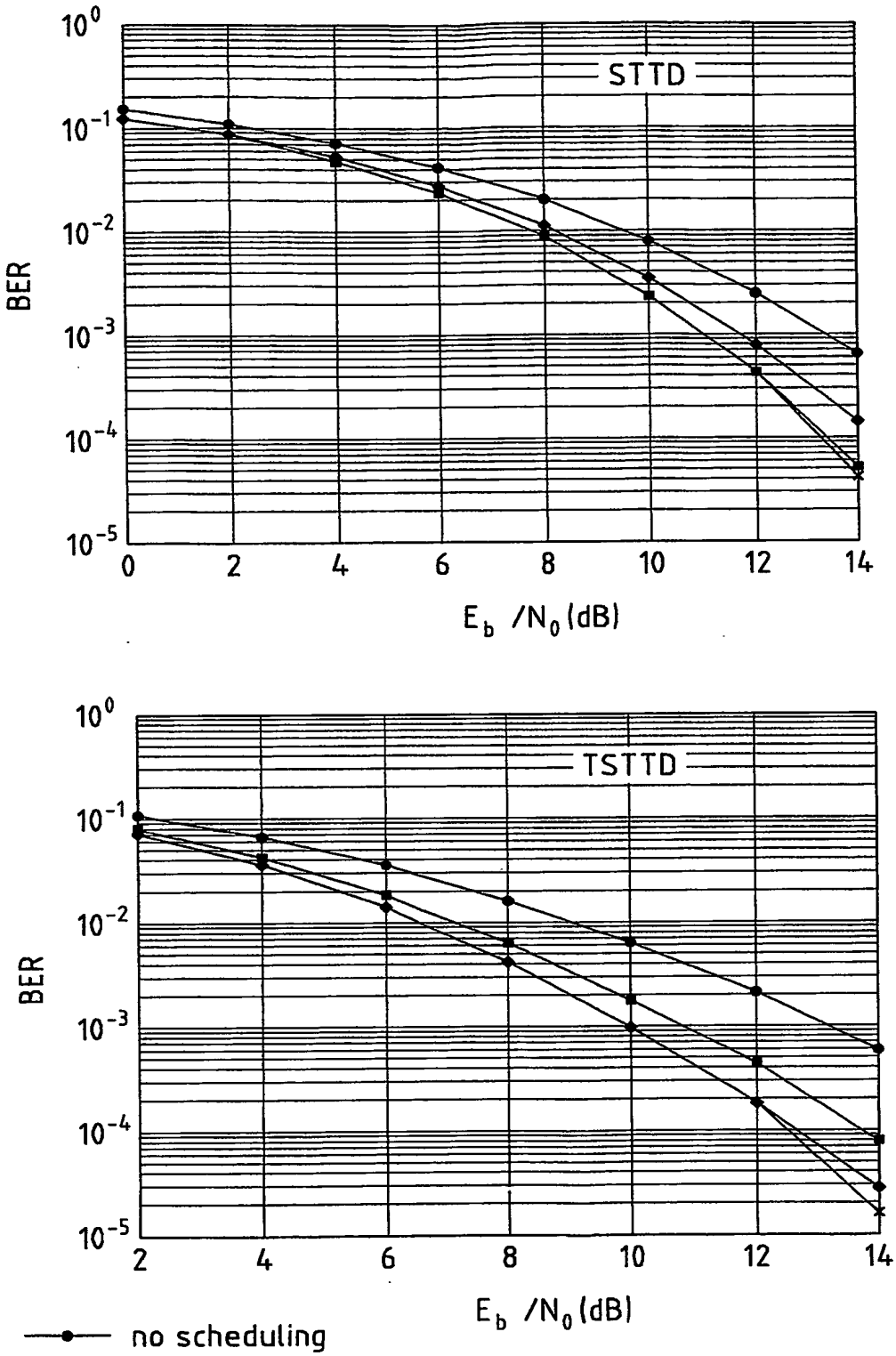

STTD
BER
10^0
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
0 2 4 6 8 10 12 14
E_b / N_0 (dB)
TSTTD
BER
10^0
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
2 4 6 8 10 12 14
E_b / N_0 (dB)
no scheduling
CQI q_K = det R_k
CQI q_k = tr R_k
CQI q_k = det $H_k^H H_k$

Fig.5A

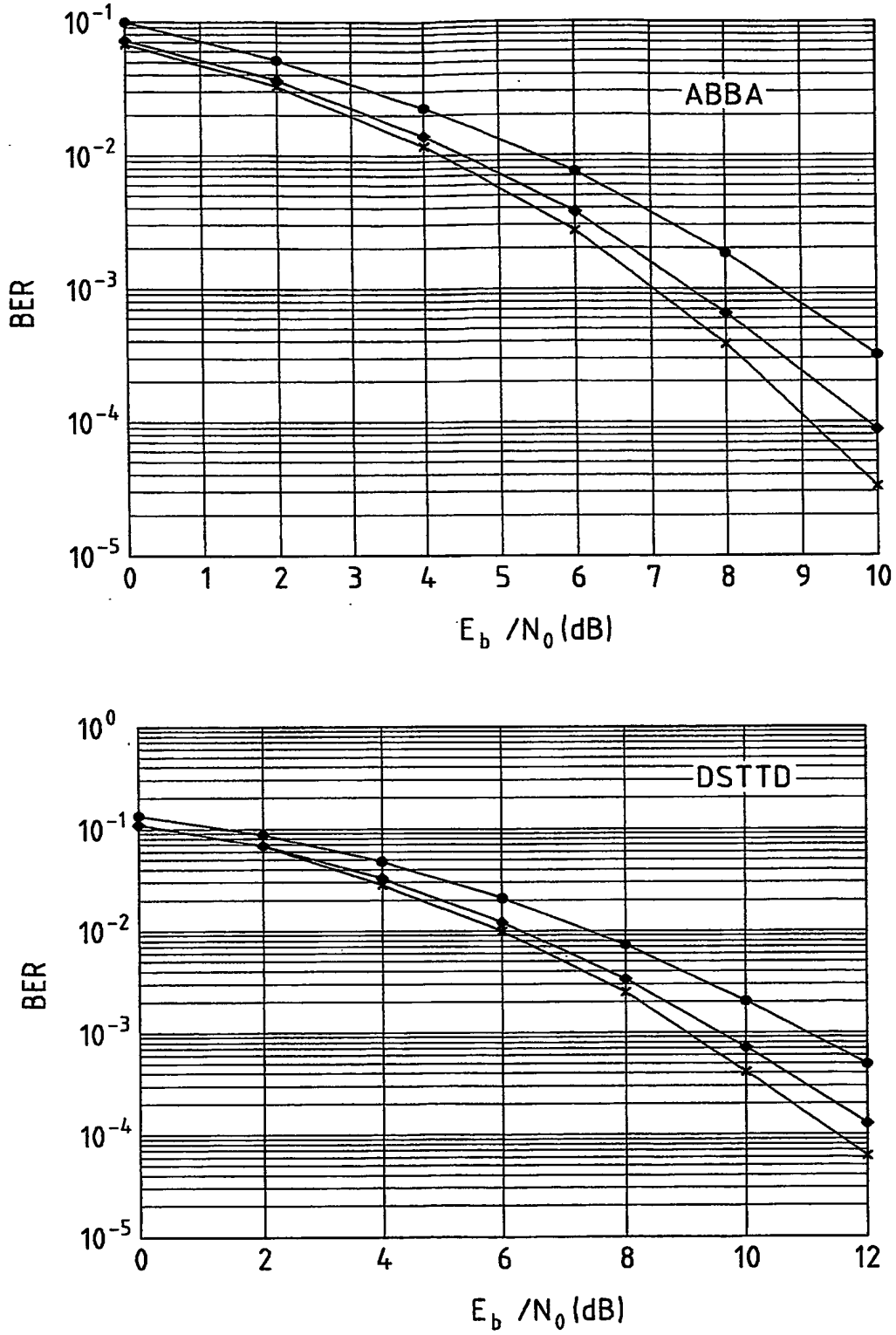
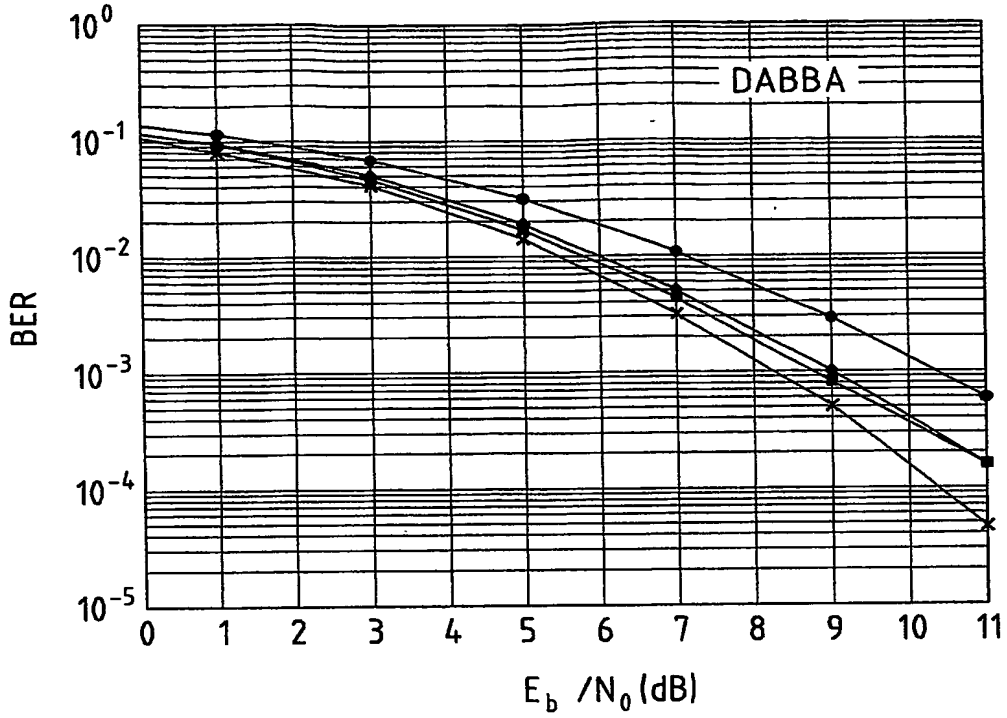

ABBA
BER
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
0 1 2 3 4 5 6 7 8 9 10
E_b / N_0 (dB)
DSTTD
BER
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
0 2 4 6 8 10 12
E_b / N_0 (dB)
no scheduling
CQI q_K = det R_k
CQI q_k = det $H_k^H H_k$

Fig.5B



no scheduling

CQI $q_K = \det R_k$

CQI $q_k = \mathrm{tr}\, R_k$

CQI $q_k = \det H_k^H H_k$

Fig.5C

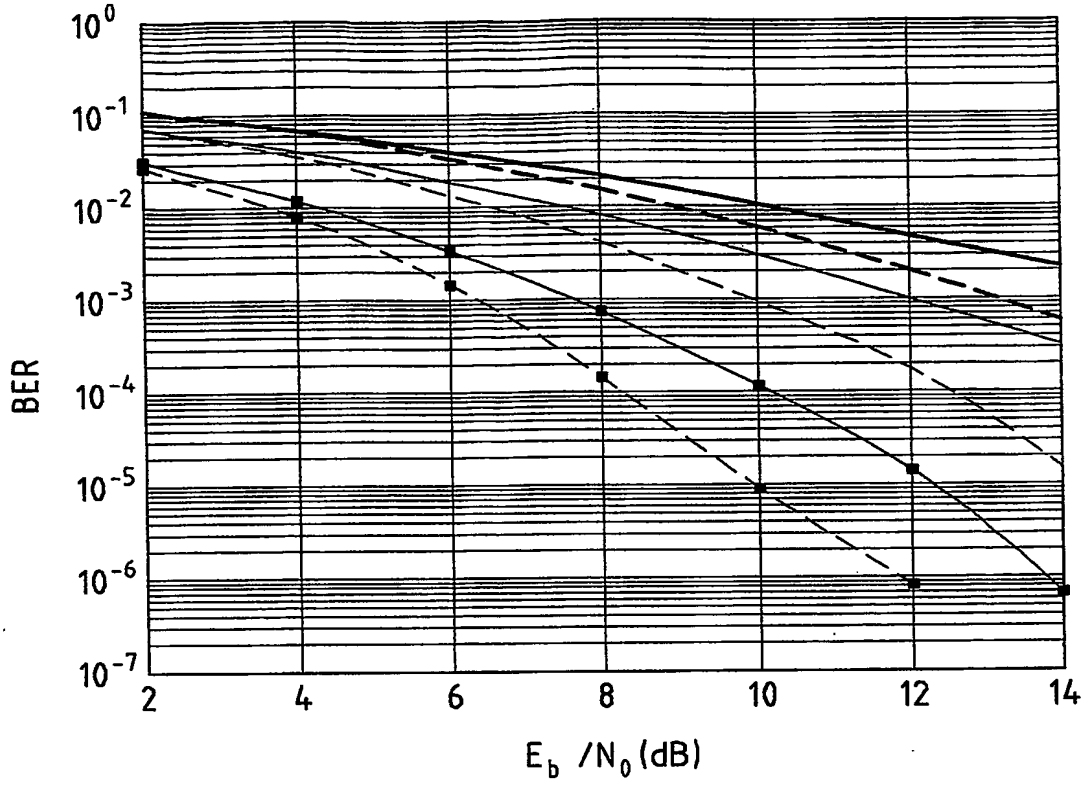

BER
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
10^{-7}
2
4
6
8
10
12
14
E_b / N_0 (dB)
BLAST : no scheduling
BLAST : CQI q_k = det $H_k^H H_k$, K=2
BLAST : CQI q_k = det $H_k^H H_k$, K=8
TSTTD : no scheduling
TSTTD : CQI q_k = det R_k , K=2
TSTTD : CQI q_k = det R_k , K=8

Fig.6

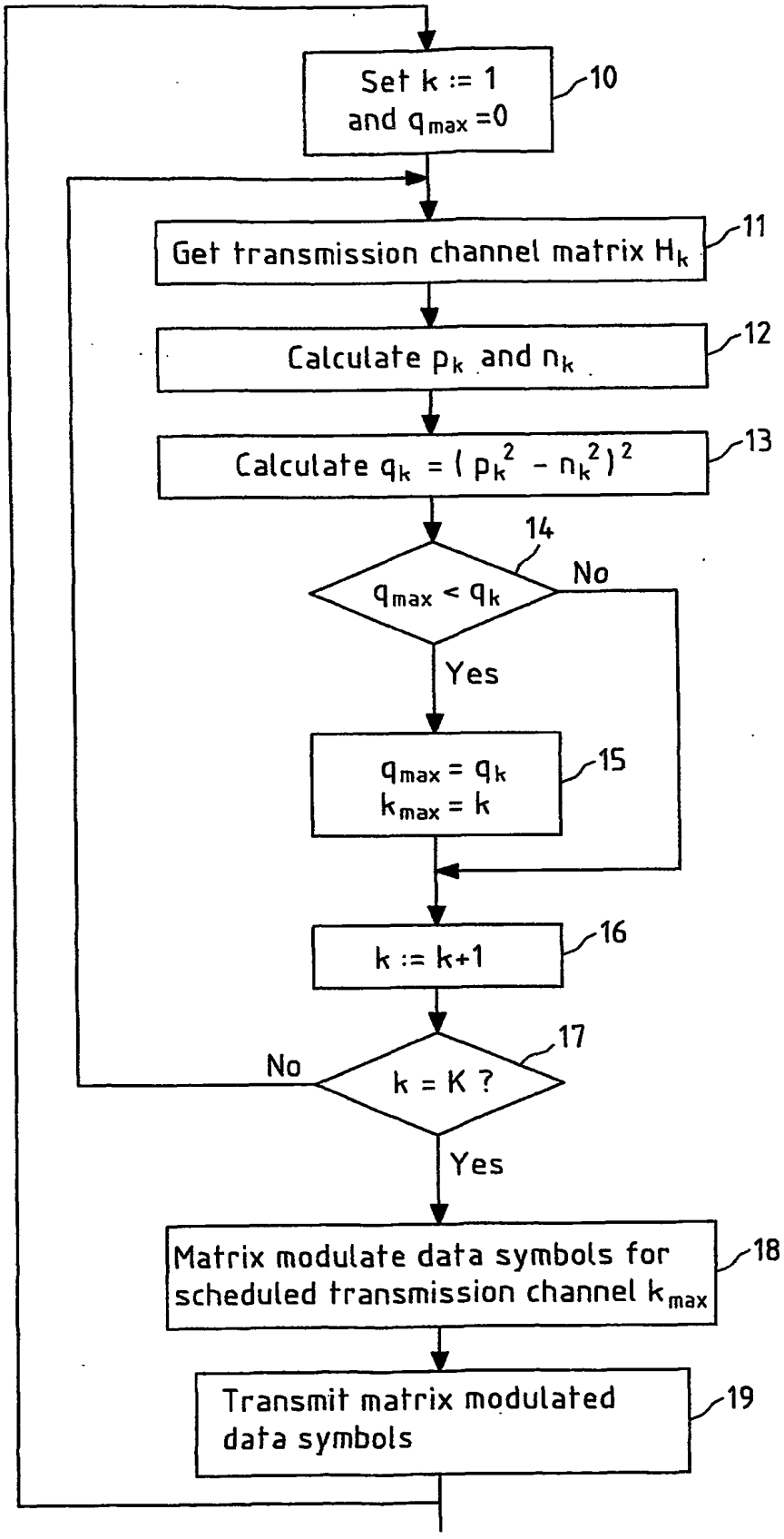

Set k := 1
and q_{max} =0
10
Get transmission channel matrix H_k
11
Calculate p_k and n_k
12
Calculate $q_k = (p_k^2 - n_k^2)^2$
13
14
$q_{max} < q_k$
No
Yes
$q_{max} = q_k$
$k_{max} = k$
15
k := k+1
16
17
No
k = K ?
Yes
Matrix modulate data symbols for scheduled transmission channel k_{max}
18
Transmit matrix modulated data symbols
19

Fig.7

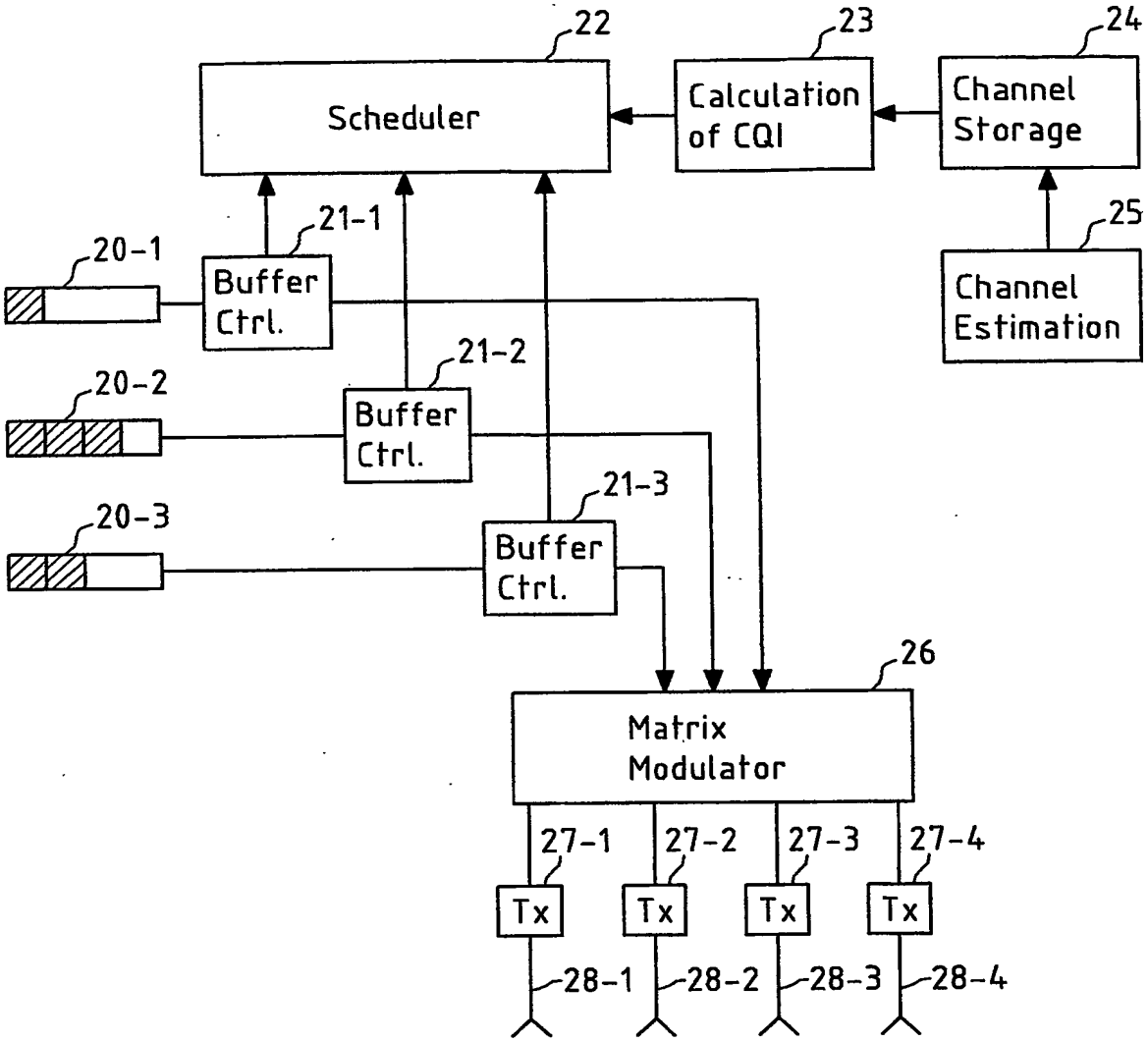

22
23
24
Scheduler
Calculation of CQI
Channel Storage
25
Channel Estimation
21-1
20-1
Buffer Ctrl.
21-2
20-2
Buffer Ctrl.
21-3
20-3
Buffer Ctrl.
26
Matrix Modulator
27-1
27-2
27-3
27-4
Tx
Tx
Tx
Tx
28-1
28-2
28-3
28-4

Fig.8